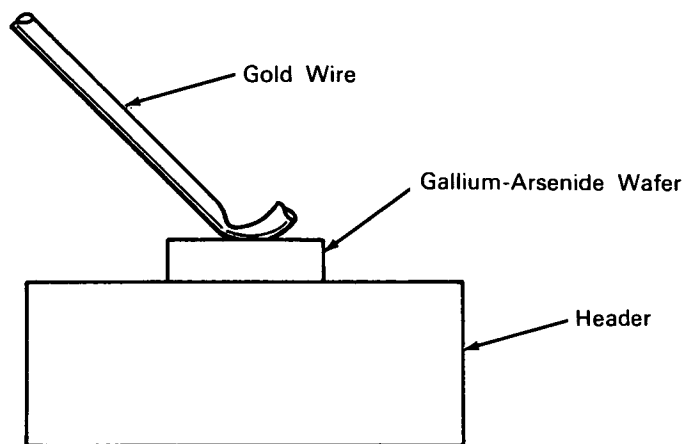


NASA TECH BRIEF



NASA Tech Briefs are issued by the Technology Utilization Division to summarize specific technical innovations derived from the space program. Copies are available to the public from the Clearinghouse for Federal Scientific and Technical Information, Springfield, Virginia, 22151.

Thermocompression Bonding Produces Efficient Surface-Barrier Diode



The problem: Current high-production diode fabrication processes involve complicated and costly etching, evaporation, or heating cycles. A process eliminating these cycles would permit economical construction of quality diodes with fast recovery times.

The solution: Thermocompression bonding of a gold wire to a gallium-arsenide wafer produces a surface barrier diode with good conduction characteristics and recovery times in fractions of a nanosecond.

How it's done: An N-type single crystal gallium arsenide wafer with a net impurity concentration of about $2.8 \times 10^{17} \text{ cm}^{-3}$ forms the diode base. A gold wire is attached to this base by thermocompression bonding at 375°C , slightly below the eutectic temperature of the combination. The wafer is then conventionally bonded to a gold-antimony plated header.

Notes:

1. The properties exhibited by this combination may be of interest to manufacturers of semiconductor devices.
2. Inquiries concerning this innovation may be directed to:

Technology Utilization Officer
Jet Propulsion Laboratory
4800 Oak Grove Drive
Pasadena, California, 91103
Reference: B65-10007

Patent status: NASA encourages commercial use of this innovation. No patent action is contemplated.

Source: International Business Machines
under contract to Jet Propulsion Laboratory
(JPL-SC-066)

Category No. 05